

CLAIMS

1. A failure sensing device of a vehicle control system including a control unit (100, 110, 120) generating a control target based on an operation request for controlling a driving state of a vehicle by manipulating a corresponding actuator using the generated control target, and a processing unit (200, 300) connected to said control unit (100, 110, 120) by a network, for generating and providing to said control unit (100, 110, 120) additional information to be used to modify said operation request or said control target, as necessary, at said control unit (100, 110, 120), wherein

said failure sensing device is provided to said control unit (100, 110, 120), and includes

an output portion outputting information to said processing unit (200, 300),

a receiving portion receiving a response corresponding to said information from said processing unit (200, 300), and

a sensing portion sensing a failure in said processing unit (200, 300) based on said information and said response.

2. The failure sensing device according to claim 1, wherein

said information is input data for calculation at said processing unit (200, 300),

and

said receiving portion receives as a response a calculation result of said input data substituted into a predetermined calculation formula at said processing unit (200, 300).

3. The failure sensing device according to claim 1, wherein

said control unit (100, 110, 120) further includes a diagnosing portion diagnosing a failure in itself.

4. The failure sensing device according to claim 1, wherein
said control unit (100, 110, 120) is configured by multiplexed calculating units.

5. The failure sensing device according to claim 1, wherein
5 said control unit (100, 110, 120) further includes a determining portion
determining interruption of control in which additional information from said processing
unit (200, 300) is reflected, when a failure of said processing unit (200, 300) is sensed
by said sensing portion.

10 6. The failure sensing device according to claim 1, wherein
said control unit (100, 110, 120) is configured by a plurality of control units (100,
110, 120) controlling an operation of a vehicle, and
said control unit (100, 110, 120) further includes a sensing portion sensing a
failure in said processing unit (200, 300) based on a plurality of sensing results from
15 sensing portions included in said plurality of control units (100, 110, 120).

7. The failure sensing device according to claim 6, wherein
priorities as to failure sensing are assigned to said plurality of control units (100,
110, 120).

20 8. The failure sensing device according to claim 7, wherein
control units (100, 110, 120) with smaller control loads are given higher
priorities.

25 9. The failure sensing device according to any of claims 1-8, wherein
units in said vehicle control system are hierarchically configured, and
said control unit (100, 110, 120) is arranged hierarchically lower than said
processing unit (200, 300).

10. A failure sensing device of a vehicle control system including a control unit (100, 110, 120) generating a control target based on an operation request for controlling a driving state of a vehicle by manipulating a corresponding actuator using the generated control target, and a processing unit (200, 300) connected to said control unit (100, 110, 120) by a network, for generating and providing to said control unit (100, 110, 120) additional information to be used to modify said operation request or said control target, as necessary, at said control unit (100, 110, 120), wherein

said failure sensing device is provided to said control unit (100, 110, 120), and includes

outputting means for outputting information to said processing unit (200, 300), receiving means for receiving a response corresponding to said information from said processing unit (200, 300), and

sensing means for sensing a failure in said processing unit (200, 300) based on said information and said response.

11. The failure sensing device according to claim 10, wherein

said information is input data for calculation at said processing unit (200, 300), and

said receiving means includes means for receiving as a response a calculation result of said input data substituted into a predetermined calculation formula at said processing unit (200, 300).

12. The failure sensing device according to claim 10, wherein

said control unit (100, 110, 120) further includes diagnosing means for diagnosing a failure in itself.

13. The failure sensing device according to claim 10, wherein

said control unit (100, 110, 120) is configured by multiplexed calculating units.

14. The failure sensing device according to claim 10, wherein

5 said control unit (100, 110, 120) further includes means for determining interruption of control in which additional information from said processing unit (200, 300) is reflected, when a failure of said processing unit (200, 300) is sensed by said sensing means.

15. The failure sensing device according to claim 10, wherein

10 said control unit (100, 110, 120) is configured by a plurality of control units (100, 110, 120) controlling an operation of a vehicle, and

said control unit (100, 110, 120) further includes means for sensing a failure in said processing unit (200, 300) based on a plurality of sensing results from sensing means included in said plurality of control units (100, 110, 120).

16. The failure sensing device according to claim 15, wherein

15 priorities as to failure sensing are assigned to said plurality of control units (100, 110, 120).

17. The failure sensing device according to claim 16, wherein

20 control units (100, 110, 120) with smaller control loads are given higher priorities.

18. The failure sensing device according to any of claims 10-17, wherein

25 units in said vehicle control system are hierarchically configured, and said control unit (100, 110, 120) is arranged hierarchically lower than said processing unit (200, 300).